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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)	ITL.1012US (P16648)	
Application Number	10/629,262	
Filed	July 29, 2003	
First Named Inventor	Anders Grunnet-Jepsen	
Art Unit	2874	
Examiner	Jerry T. Rahll	

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on November 6, 2007

Signature

Typed or printed name Nancy Meshkoff

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☑ attorney or agent of record.
Registration number 28,994

☐ attorney or agent acting under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 ______

Signature

Timothy N. Trop
Typed or printed name

(713) 468-8880
Telephone number

November 6, 2007
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of ______ forms are submitted.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:		§		
	Anders Grunnet-Jepsen et al.	§	Art Unit:	2874
		§		
Serial No.:	10/629,262	§	Examiner:	Jerry T. Rahll
		§		
Filed:	July 29, 2003	§	Docket:	ITL.1012US P16648
		§		
For:	Segmented Waveguide Coupler	§	Assignee:	Intel Corporation

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

STATEMENT IN SUPPORT OF PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:

Claim 1 is as follows (with references to Figure 1 in parentheses):

1. A planar light wave circuit comprising:

a substrate;

a pair of waveguides (14, 16) formed on said substrate; and

a coupling region (12a, 12b) formed between said waveguides, at least one of said waveguides being segmented in said coupling region.

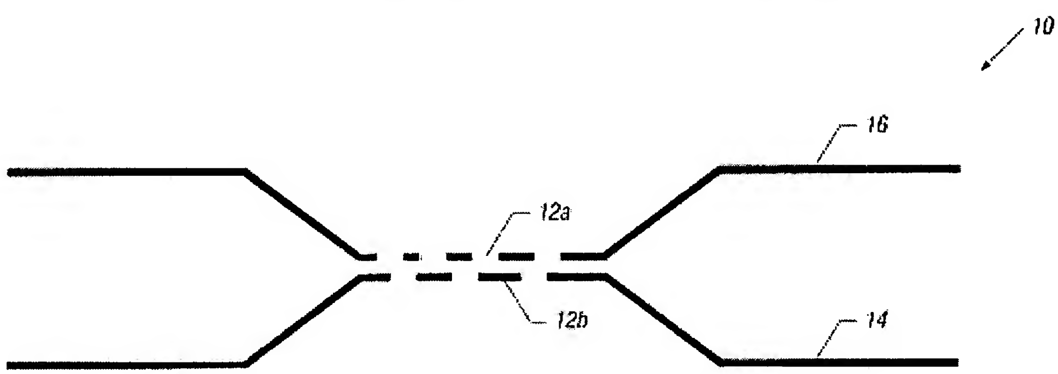

FIG. 1

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Nancy Meshkoff

The Examiner suggests that inherently a Bragg grating is segmented. This is simply untrue. *See* Exhibit A. Nonetheless, the final rejection is maintained, suggesting, again, that it is well known that Bragg gratings are segmented. The applicant has cited material which demonstrates this is untrue and, therefore, a substantial issue arises with respect to whether or not Bragg gratings are segmented. Particularly, Bragg gratings are written using UV light. Thus, there is no reason why they would be segmented because exposure to such light does not segment the waveguide.

Claim 3, for example, calls for one of the waveguides being segmented "by having at least two gaps along the length of the waveguide in the coupling region." The suggestion that nothing in the claims requires that gaps be empty of material is certainly surprising. One wonders what the Examiner believes a gap might be? There are no gaps or anything that could possibly be called a gap in the cited reference. There is simply a conventional Bragg grating with nothing added to it and nothing taken away from it. To suggest that this is segmented simply reads the word "segmented" out of the claim. Similarly, the suggestion that a gap could be simply an undifferentiated piece of material is to read a "gap" out of the claim. There is simply no basis for the maintenance of the rejection and reconsideration is respectfully requested.

The assertion that Snitzer describes a Bragg grating forming the segmented portions of the waveguides is certainly surprising since nothing in Snitzer ever mentions anything that is segmented. No support is ever provided for this assertion. In fact, no support is provided whatsoever that Snitzer is segmented. The assertion that the region 105 is segmented is unsupportable. It is simply a region which is written to by ultraviolet light. It is no way segmented any more than anything else in the waveguide. The assertion that "Snitzer describes a Bragg grating forming the segmented portions of waveguides" is without support. The assertion that "a Bragg grating inherently has at least two gaps formed therein" is completely unsupportable. In order to be inherent, it must necessarily be true. Since a Bragg grating is simply formed by exposure to ultraviolet light, there is no reason why a Bragg grating would be segmented or would have one gap, much less two gaps. Moreover, no reason has ever been provided.

The assertion of well known gaps in Bragg gratings should be supported and should have been supported by now. Despite the fact that the applicant has shown that this is not the case the position has been maintained. Reconsideration should be undertaken.

Claim 4 calls for gaps that are irregularly sized. From the total absence of any teaching of a gap, the Examiner, nonetheless, rejects claims that call for specifically configured gaps. There is no basis for such a rejection.

Similarly, claim 5 calls for regularly sized along the length of the coupling region. Not only does the reference not show one gap, it does not show two gaps, and it tells nothing about any gaps whatsoever and, therefore, cannot teach the specific feature of the size of the gaps.

In sum, a rejection is based on a reference which teaches not one thing that is pertinent to the claimed invention. As a result, the rejection cannot be sustained and should be reconsidered.

Respectfully submitted,

Date: November 6, 2007

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EXHIBIT A

Fiber-Optic Communications Technology

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Prentice Hall

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Columbus, Ohio

has a bandwidth of 0.2 nm: to get to 40 nm, one has to use a device about 1 m in length. (Such FBG devices have indeed been fabricated.)

There is a trade-off between an FBG's bandwidth and its delay, that is, its compensation ability. For example, suppose an FBG introduces a 1400-ps/nm delay. This number means the FBG can introduce, theoretically, a delay of 1400 ps/nm over a 1-nm bandwidth or a delay of 140 ps/nm over a 10-nm bandwidth.

Fabrication of an FBG In 1978, Canadian scientist Kenneth Hill discovered fortuitously that the refractive index of the core of a fiber can be changed under exposure to ultraviolet light. This phenomenon, called *fiber photosensitivity,* is the physical basis for grating fabrication. There are two basic fabrication methods today: The original one—directly exposing a fiber's core to a pair of interfering UV beams—provides radiation of both maximum and minimum intensity. The minimum intensity leaves the refractive index unchanged and the maximum intensity changes the refractive index.

Hill and his colleagues also developed a second fabrication method—the phase-mask technique. Based on essentially the same interference principle, it gives much better results because of the higher grating precision it imposes.

In general, then, FBGs are considered the most promising dispersion-compensation devices. There are already many commercially available types of chirped-fiber Bragg gratings, and these seem to represent the direction in which the industry is going. FBGs are well on their way to giving DCFs stiff competition ([3], [6]). You can get an idea what commercial level the characteristics of chirped-fiber Bragg gratings have reached today by looking at the following data of a modern FBG [7]: bandwidth—from 4 to 10 nm; dispersion—from −700 ps/nm to −1400 ps/nm; insertion loss < 4 dB; PMD < 4 ps; PDL < 0.25 dB, and return loss (see Chapter 8) > 50 dB. The unit can compensate for third-order dispersion. The physical dimension is 212 × 155 × 20 mm.

Dispersion compensation is so important for long-haul systems that scientists continue to search for effective new solutions. Several competitive dispersion-compensating techniques are currently in the research stage.

Dispersion Compensation: The System Viewpoint

We have to keep in mind that we need to compensate for dispersion only for the purpose of increasing system bandwidth, or bit rate. But evaluation of dispersion-compensating devices should also take into account all other performance characteristics of a fiber-optic communications system. Let's consider dispersion compensation from the system standpoint.

In modern fiber-optic communications systems, dispersion—not loss—becomes the distance-limiting factor.

If we rearrange Formula 5.13 in such a way that

$$L_{max} = 1/[4BR|D(\lambda)|\Delta\lambda], \tag{6.11}$$

we can calculate the maximum length of a fiber link limited by chromatic dispersion. Let's take these typical parameters: $D(\lambda)$ = 17 ps/nm·km at λ = 1550 nm, $\Delta\lambda$ = 0.2 nm, and BR = 2.5 Gbps. One finds L_{max} (dispersion) = 29.4 km. Our calculations of loss-distance limitations in Example 5.2.1 showed L_{max} (loss) = 73.12 km. These numbers give you an idea of how dispersion-distance and loss-distance limitations relate to each other.

It seems that with improved dispersion-compensating techniques, this problem could be overcome. For example, for a DSF fiber, $D(\lambda)$ is not more than 2.5 ps/nm·km, which gives L_{max} = 199.9 km. Thus loss-distance limitation becomes the major restriction again. On the other hand, if one arranges the transmission of a high-power signal with in-line optical amplifiers, it looks as though the loss-distance limit disappears. In reality, however, both approaches do not allow us to achieve our goal. Pumping too much power into a fiber and working near a zero-dispersion wavelength cause other restrictions associated with nonlinear effects. These are discussed later in this chapter.